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09/928,314

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Tim J. Corbett

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EXAMINER

FOURSON III, GEORGE R

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte TIM J. CORBETT

Appeal 2009-003809
Application 09/928,314¹
Technology Center 2800

Decided: August 11, 2009

Before MAHSHID D. SAADAT, SCOTT R. BOALICK, and
MARC S. HOFF, *Administrative Patent Judges*.

BOALICK, *Administrative Patent Judge*.

DECISION ON APPEAL

¹ Application filed Aug. 13, 2001. The real party in interest is Micron Technology, Inc.

This is an appeal under 35 U.S.C. § 134(a) from the final rejection of claims 1-23, all the claims pending in the application. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm.

STATEMENT OF THE CASE

Appellant's invention relates to a method for marking the surface of a semiconductor chip. (Spec. Abstract.) A laser beam is directed at the surface of the chip where a laser reactive material is present. (Spec. Abstract.) The laser reactive material is heated by the laser beam, causing it to fuse to the surface of the chip to create a visibly distinct mark. (Spec. Abstract.)

Claim 1 is exemplary:

1. In a method of producing semiconductor chips wherein the chips are at least fabricated and characterized, the improvement comprising:

marking with identifying indicia only those chips which are characterized for use by exposing selected locations of at least one of a surface of at least one semiconductor chip and an energy-reactive marking material to energy to cause said energy-reactive marking material to adhere to said surface.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Folk	US 4,594,263	Jun. 10, 1986
Corley	US 5,256,578	Oct. 26, 1993
Meneghini	US 5,757,313	May 26, 1998 (filed Dec. 6, 1995)

Appellant's "admitted prior art," at pages 2-3 of the present Application.

Claims 1-18 stand rejected under 35 U.S.C. § 103(a) as being obvious over Folk and Meneghini.

Claims 19-23 stand rejected under 35 U.S.C. § 103(a) as being obvious over the combination of Folk, Meneghini, Appellant's "admitted prior art" and Corley.

Rather than repeat the arguments of Appellant or the Examiner, we refer to the Briefs and the Answer for their respective details. Except as noted in this decision, Appellant has not presented any substantive arguments directed separately to the patentability of the dependent claims or related claims in each group. In the absence of a separate argument with respect to those claims, they stand or fall with the representative independent claim. *See* 37 C.F.R. § 41.37(c)(1)(vii). Only those arguments actually made by Appellant have been considered in this decision. Arguments that Appellant did not make in the Briefs have not been considered and are deemed to be waived. *See id.*

ISSUE

With respect to claims 1-23, Appellant argues that both Folk and Corley teach away from the use of ink for marking semiconductor devices. (Reply Br. 4-5.) In addition, with respect to claims 1-18, Appellant argues that a *prima facie* case for obviousness has not been established "because Folk clearly teaches away from the asserted combination of teachings thereof with the type of teachings provided by Meneghini [sic]." (App. Br. 7; *see also* Reply Br. 4-5.) Furthermore, with respect to dependent claims 19-21 Appellant argues that the combination of Folk, Meneghini, Appellant's

“admitted prior art” and Corley does not teach or suggest the limitations recited in these claims. (Reply Br. 5.)

Appellant’s arguments present the following issue:

Has Appellant shown that the Examiner erred in rejecting claims 1-23 under 35 U.S.C. § 103(a)?

The resolution of this issue turns on the following subsidiary issues:

1. Has Appellant shown that the Examiner erred in combining the applied references?

2. Has Appellant shown that the Examiner erred in finding that the combination of Folk, Meneghini, Appellant’s “admitted prior art” and Corley teaches or suggests “comparing . . . identifying indicia to an identifying indicia model,” as recited in dependent claim 19?

3. Has Appellant shown that the Examiner erred in finding that the combination of Folk, Meneghini, Appellant’s “admitted prior art” and Corley teaches or suggests “determining whether . . . [the] identifying indicia substantially match[] . . . [the] identifying indicia model,” as recited in dependent claim 20?

4. Has Appellant shown that the Examiner erred in finding that the combination of Folk, Meneghini, Appellant’s “admitted prior art” and Corley teaches or suggests “rejecting” a “semiconductor chip . . . if its respective identifying indicia does [sic] not substantially match . . . [the] identifying indicia model,” as recited in dependent claim 21?

FINDINGS OF FACT

The record supports the following findings of fact (FF) by a preponderance of the evidence.

Folk

1. Folk relates to “marking of metal surfaces using laser energy” (col. 1, ll. 6-7) for semiconductor device packages (col. 1, ll. 46-48). Semiconductor packages 21 are coated with a nickel layer (col. 1, ll. 55-56) which is blackened by exposure to an acid solution (col. 1, ll. 57-58). The semiconductor packages 21 are marked with a laser marking apparatus 21 (col. 2, ll. 47-49; fig. 2) that ablates the blackened nickel layer, exposing the underlying shiny metal surface (col. 1, ll. 61-64).
2. Folk further describes that the most common prior art method of marking semiconductor packages is the application of wet ink. (Col. 1, ll. 25-26.) The wet ink “must then be cured for a period of time” and “involve[s] several stages of handling.” (Col. 1, ll. 28-29.)

Meneghini

3. Meneghini relates to the “irradiation of an ink-bearing carrier with laser light [that] causes the ink to transfer from the carrier to a surface, e.g., the surface of a microelectronic device.” (Col. 1, ll. 12-14.) “The method includes the steps of irradiating the particular transfer printing medium with laser light of a predetermined wavelength to transfer the ink from the carrier to a surface of interest, and curing the ink to adhere the ink to the surface of interest.” (Col. 1, l. 65 to col. 2,

l. 2.) Furthermore, “[t]he transfer and cure of the ink may be effected in a single step through irradiation with said laser light.” (Col. 2, ll. 2-4.)

Corley

4. Corley relates to the “storage of semiconductor wafer map information.” (Col. 1, ll. 8-9.) Corley describes that semiconductor devices are fabricated as multiple individual die on a single semiconductor wafer. (Col. 1, ll. 10-11.) Each individual die is tested “to distinguish unusable die from good die” before separation from the wafer. (Col. 1, ll. 16-17.) “To facilitate separation of the good and bad die, the bad die are typically marked using a colored ink dot.” (Col. 1, ll. 17-19.) Furthermore, test results from different categories (e.g. voltage, temperature or speed) can be distinguished using different color dots (col. 1, ll. 20-24) in which individual die can be selected based on the color of the ink dot (col. 1, ll. 24-26).
5. Corley further describes marking individual die with ink dots as having “definite shortcomings.” (Col. 1, ll. 30-31.) Such shortcomings include the limited availability of ink colors, chemical damage to the die or the packaged device, or smearing or bleeding of the ink. (Col. 1, ll. 31-34.) Additionally, the ink dot can also fall off the die after drying (col. 1, ll. 34-35), ink removal requires “hazardous” solvents (col. 1, ll. 37-40) and “extra housekeeping effort[s]” to clean ink stains (col. 1, ll. 40-43).

Specification

6. In the “Background of the Invention,” Appellant describes that semiconductor devices are marked by “[c]onventional . . . methods [utilizing] a mechanical device to transfer ink contained in an ink pad to the surface of a stamp.” (Spec. ¶ [0003].) Appellant also describes that “manufacturers have found it necessary to mark each chip or assembly of chips (bare die or package) with the company name, a part or serial number, or other information such as lot number or die location.” (Spec. ¶ [0003].) Moreover, one “problem associated with ink stamping methods is that the quality of ink stamped marks may substantially vary over time” and that “the consistency of a stamped mark may vary widely from chip to chip.” (Spec. ¶ [0005].)

PRINCIPLES OF LAW

On appeal, all timely filed evidence and properly presented arguments are considered by the Board. *See In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984).

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.’” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). In *KSR*, the Supreme Court emphasized “the need for caution in granting a patent based on the combination of elements found in the prior art,” *id.* at 415, and discussed circumstances in which a patent might be determined to be obvious. In particular, the Supreme Court emphasized that

“[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.* at 416. The Court explained:

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

Id. at 417. The Court also noted that “[c]ommon sense teaches . . . that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.” *Id.* at 420.

“[W]hen the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious.” *Id.* at 416 (citing *United States v. Adams*, 383 U.S. 39, 51-52 (1966)). “A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant.” *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994). However, “[a] known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use.” *Id.*

ANALYSIS

We do not find Appellant's arguments that the Examiner erred in rejecting claims 1-23 under 35 U.S.C. § 103(a) to be meritorious.

Claims 1-18

Appellant argues claims 1-18 together as a group. (App. Br. 5.) Accordingly, we select claim 1 as representative. *See* 37 C.F.R. § 41.37(c)(1)(vii).

Appellant's arguments (App. Br. 7-8; *see also* Reply Br. 4-5) contending that Folk teaches away from the Examiner's proposed combination of Folk and Meneghini are not persuasive. Likewise, Appellant's arguments contending that Corley teaches away from the Examiner's proposed combination of Folk and Meneghini are also not persuasive. (Reply Br. 4-5.)

The Examiner found that Folk teaches the limitation "marking with identifying indicia only those chips which are characterized for use," as recited in claim 1. (Ans. 3; FF 1.) The Examiner acknowledged that Folk does not teach "exposing selected locations of at least one of a surface of at least one semiconductor chip and an energy-reactive marking material to energy to cause said energy-reactive marking material to adhere to said surface," as recited in claim 1. (Ans. 3.) The Examiner cited Meneghini for the disclosure of this claim limitation. (Ans. 3; FF 3.) We agree.

Appellant's arguments contending that "Folk strongly discourages the use of materials of the type taught in Menghini [sic] in place of the nickel coating of Folk, thereby teaching away from this asserted combination of reference teachings" (App. Br. 8; *see also* Reply Br. 4-5) lack merit. Folk

teaches a common prior art method of marking semiconductor packages with wet ink, which “must then be cured for a period of time” and “involve[s] several stages of handling.” (FF 2.) Thus, Folk describes that marking semiconductor packages with wet ink is “somewhat inferior,” due to extra curing time, rather than “teaching away” from the use of all inks. *See Gurley*, 27 F.3d at 553. Furthermore, Meneghini teaches laser irradiating an ink-bearing carrier to transfer the ink from the carrier to a microelectronic device and curing the ink in a single step. (FF 3.) Thus, Meneghini’s laser irradiation method for transferring and curing ink in a single step provides a solution to Folk’s prior art method of applying wet ink (*see* FF 2-3).

Although Corley was not applied in rejecting claims 1-18, Appellant’s arguments contending that Corley “teaches away from the use of ink dots for identifying semiconductor devices” (Reply Br. 4-5) lack merit. Corley teaches that marking a die with ink dots has “definite shortcomings” and enumerates several disadvantages. (FF 5.) Thus, Corley describes that the application of ink dots for marking semiconductor devices as “somewhat inferior” due to “definite shortcomings” associated with ink, rather than “teaching away” from the use of all inks. *See Gurley*, 27 F.3d at 553.

Moreover, combining Folk with Meneghini is no more than the simple substitution of Meneghini’s known method of laser irradiating an ink-bearing carrier to transfer the ink from the carrier to a microelectronic device for Folk’s known method of laser ablating a blackened nickel layer on semiconductor packages, with no unexpected results. *See KSR*, 550 U.S. at 417. Appellant has not presented any convincing arguments or evidence that the Examiner erred in combining Folk with Meneghini.

Therefore, Appellant has not shown that the Examiner erred in combining Folk with Meneghini. We conclude that Appellant has not shown that the Examiner erred in rejecting claim 1 under 35 U.S.C. § 103(a). Claims 2-18 were not argued separately, and fall together with claim 1.

Claim 19

Appellant's arguments (Reply Br. 5) contending that the combination of Folk, Meneghini, Appellant's "admitted prior art" and Corley does not teach or suggest "comparing . . . identifying indicia to an identifying indicia model," as recited in dependent claim 19, are not persuasive.

The Examiner found that Appellant's "admitted prior art" teaches that "smudging of ink marks and deterioration of the quality of marks over time [results] from changes in stamp surface condition." (Ans. 4; FF 6.) The Examiner further found that "it is inherent that [there is] a comparison between an ideal/acceptable mark and the actual mark in question." (Ans. 4.) We agree.

Appellant's "admitted prior art" teaches that "the quality of ink stamped marks may substantially vary over time" in which "the consistency of a stamped mark may vary widely from chip to chip." (FF 6.) To determine the quality of the ink stamped mark (i.e., identifying indicia) at any point in time, one of ordinary skill in the art would compare this ink stamped mark to a standard ink step mark (i.e., identifying indicia model). Thus, Appellant's "admitted prior art" teaches or suggests the step of "comparing . . . identifying indicia to an identifying indicia model," as recited in dependent claim 19.

Furthermore, Appellant's "admitted prior art" relates to marking semiconductor devices. (FF 6.) Similarly, Folk, Meneghini and Corley relate to the marking of semiconductor devices (FF 1, 3, 4). Thus, modifying Folk, Meneghini and Corley to include the step in Appellant's "admitted prior art" of comparing identifying indicia to an identifying indicia model for the purposes of quality control, would have been obvious because a person of ordinary skill in the art would recognize that this step would improve the quality of indicia applied on the semiconductor device in the same way as the prior art. *See KSR*, 550 U.S. at 417. Appellant has not presented any convincing arguments or evidence that the Examiner erred in combining Appellant's "admitted prior art" with Folk, Meneghini and Corley.

Appellant's arguments (Reply Br. 4-5) contending that both Folk and Corley teach away from the use of ink for marking semiconductor devices are also not persuasive for the reasons previously discussed.

Therefore, Appellant has not shown that the Examiner erred in finding that the combination of Folk, Meneghini, Appellant's "admitted prior art" and Corley teaches or suggests "comparing . . . identifying indicia to an identifying indicia model," as recited in claim 19.

We conclude that Appellant has not shown that the Examiner erred in rejecting claim 19 under 35 U.S.C. § 103(a).

Claim 20

Appellant's arguments (Reply Br. 5), contending that the combination of Folk, Meneghini, Appellant's "admitted prior art" and Corley does not teach or suggest "determining whether . . . [the] identifying indicia

substantially match[] . . . [the] identifying indicia model,” as recited in dependent claim 20, are not persuasive.

As discussed above, to determine the quality of the ink stamped mark (i.e., identifying indicia) at any point in time, one of ordinary skill in the art would compare this ink stamped mark to a standard ink stamped mark (i.e., identifying indicia model). Comparing two objects is defined as noting similarities or differences between the two objects. *See Webster’s II New Riverside University Dictionary* 289 (1984). Thus, comparing the two ink stamped marks includes determining whether the identifying indicia are substantially similar to or different from the identifying indicia model. Accordingly, Appellant’s “admitted prior art” teaches or suggests the step of “determining whether . . . [the] identifying indicia substantially match[] . . . [the] identifying indicia model,” as recited in dependent claim 20.

Similar to the discussion above, modifying Folk, Meneghini and Corley to include the step in Appellant’s “admitted prior art” of determining whether the identifying indicia are substantially similar or different from the identifying indicia model, would have been obvious because a person of ordinary skill in the art would recognize that this step would improve similar devices in the same way as the prior art. *See KSR*, 550 U.S. at 417. Appellant has not presented any convincing arguments or evidence that the Examiner erred in combining Appellant’s “admitted prior art” with Folk, Meneghini and Corley.

Appellant’s arguments (Reply Br. 4-5) contending that both Folk and Corley teach away from the use of ink for marking semiconductor devices are also not persuasive for the reasons previously discussed.

Therefore, Appellant has not shown that the Examiner erred in finding that the combination of Folk, Meneghini, Appellant's "admitted prior art" and Corley teaches or suggests "determining whether . . . [the] identifying indicia substantially match[] . . . [the] identifying indicia model," as recited in claim 20.

We conclude that Appellant has not shown that the Examiner erred in rejecting claim 20 under 35 U.S.C. § 103(a).

Claim 21

Appellant's arguments (Reply Br. 5) contending that the combination of Folk, Meneghini, Appellant's "admitted prior art" and Corley does not teach or suggest "rejecting" a "semiconductor chip . . . if its respective identifying indicia does [sic] not substantially match . . . [the] identifying indicia model," as recited in dependent claim 21, are not persuasive.

As discussed above regarding claim 20, one of ordinary skill in the art would determine whether the identifying indicia are substantially similar or different from the identifying indicia model. It would have been obvious, at the very least as an exercise of common sense, to reject a semiconductor chip if the identifying indicia are different from the identifying indicia model. *See KSR*, 550 U.S. at 420. Furthermore, Corey teaches sorting unusable semiconductor die from good die (i.e., rejecting a semiconductor chip) based on different colored ink dots. (FF 4.) Thus, Appellant's "admitted prior art" teaches or suggests "rejecting" a "semiconductor chip . . . if its respective identifying indicia does [sic] not substantially match . . . [the] identifying indicia model," as recited in dependent claim 21.

Similar to the discussion above, modifying Folk, Meneghini and Corley to include the step in Appellant's "admitted prior art" of rejecting a semiconductor chip if the identifying indicia do not substantially match the identifying indicia model, would have been obvious because a person of ordinary skill in the art would recognize that this step would improve similar devices in the same way as the prior art. *See KSR*, 550 U.S. at 417. Appellant has not presented any convincing arguments or evidence that the Examiner erred in combining Appellant's "admitted prior art" with Folk, Meneghini and Corley.

Appellant's arguments (Reply Br. 4-5) contending that both Folk and Corley teach away from the use of ink for marking semiconductor devices are also not persuasive for the reasons previously discussed.

Therefore, Appellant has not shown that the Examiner erred in finding that the combination of Folk, Meneghini, Appellant's "admitted prior art" and Corley teaches or suggests "rejecting" a "semiconductor chip . . . if its respective identifying indicia does [sic] not substantially match . . . [the] identifying indicia model," as recited in claim 21.

We conclude that Appellant has not shown that the Examiner erred in rejecting claim 21 under 35 U.S.C. § 103(a).

Claims 22 and 23

Although Appellant nominally argues the rejection of dependent claims 22 and 23 separately (App. Br. 8-9), the arguments presented do not point out with particularity or explain why the limitations of the dependent claims are separately patentable. Instead, Appellant summarily alleges that neither Appellant's "admitted prior art" nor Corley "would have convinced

one of ordinary skill in the art to ignore the fact that Folk teaches away from the combination of teachings thereof with teachings from Menghini [sic].” (App. Br. 8.) Because Appellant has not persuasively rebutted the Examiner’s prima facie case of obviousness for dependent claims 22 and 23 based on the teachings of Folk and Meneghini, we will sustain the rejection of claims 22 and 23 for the reasons discussed with respect to independent claim 13, from which claims 22 and 23 depend.

CONCLUSION

Based on the findings of facts and analysis above, we conclude that Appellant has not shown that the Examiner erred in rejecting claims 1-23 under 35 U.S.C. § 103(a).

DECISION

The rejection of claims 1-23 under 35 U.S.C. § 103(a) is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

Appeal 2009-003809
Application 09/928,314

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